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ABSTRACT

This paper, addressed to decision makers and non-technicians, explains why an information policy is necessary prior to establishing a National Information System (NATIS). It describes the need to assess the flow or non-flow of information to provide data for planning improvements in existing information services and consideration of new services. How to develop an information plan, and how to finalize and present NATIS plans through reviewing services, making recommendations, and using effective machinery to implement recommendations are explained. (Author/KP)

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NATIS

NATIONAL INFORMATION SYSTEMS

NATIONAL INFORMATION POLICY

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CONTENTS

		Page
	Foreword	i
	Preface	iii
1	Why is an information policy necessary ?	1
2	Review of constraints on the flow of information	4
3	The nature of information	6
4	The NATIS planning machinery	8
5	Assessing the national situation	12
6	Developing the information plan	15
7	Finalizing and presenting the NATIS plan	23

FOREWORD

The Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastructures, organized by Unesco in co-operation with the International Federation for Documentation (FID), the International Federation of Library Associations (IFLA) and the International Council on Archives (ICA), met in Paris from 23 to 27 September 1974, and adopted unanimously recommendations supporting the concept and objectives of national information systems (NATIS), encompassing all services involved in the provision of information for all sectors of the community and for all categories of users.

The recommendations were subsequently approved by the General Conference of Unesco at its 18th session (18 C/5 approved, Resolution 4.201), which authorized the Director-General to draw up a long-term programme for the implementation of NATIS in Member States for submission to its 19th session in 1976, and in the meantime to take all necessary steps to ensure the most effective implementation of the recommendations of the Intergovernmental Conference, particularly "to issue to Member States, after due consultation with the appropriate international non-governmental organizations (FID, IFLA and ICA), and not later than December 1976, general guidelines for the implementation of NATIS".

The Unesco Department of Documentation, Libraries and Archives accordingly prepared an outline of the guidelines for national action needed to achieve the 12 NATIS objectives as set forth in the booklet National Information Systems : Objectives for national and international action (COM.74/NATIS/3 rev.). The guidelines proposed in this outline, which were subsequently discussed at length and approved by a group of experts meeting at Unesco headquarters from 11 to 13 December 1974, cover the following topics :

- National information policy ;
- Design and planning of national information systems (NATIS);
- Methodology of analysis of users' needs and inventory of existing information resources ;
- Establishment of a legislative framework for the implementation of NATIS ;
- Methodology of cost analysis for the effective implementation of the national plan for NATIS (in the context of its contribution to national development).

To provide a permanent consultative mechanism to advise the Secretariat on the preparation of these guidelines and to ensure a continuous feedback from the specialized groups in the fields of documentation, libraries and archives, a NATIS ad hoc working group was set up, composed of representatives of FID, IFLA and ICA.

As an outcome of consultations between the Secretariat and this group the first two guidelines have been prepared and are being widely distributed for evaluation.

The first guideline entitled National information policy, by Dr. D.J. Urquhart, formerly Director of the British Library Lending Division at Boston Spa (United Kingdom) is addressed to decision-makers and non-technicians. It explains why an information policy is necessary, and describes the need to assess the national situation, how to develop the information plan and how to finalize and present the NATIS plans.

The second guideline on the Design and planning of national information systems ; a paper for government planners, by Mr. Björn Tell, Director of Libraries, University of Lund (Sweden), is intended to encourage governments convinced of the need to develop national information systems (NATIS) as an indispensable tool for their countries' economic, cultural and social well-being, to create the mechanisms which could pursue that goal. It is addressed particularly, at this stage, to the information-poor countries where it might be of vital importance to organize information services to function in support of the educational and industrial policies.

It is hoped that these two guidelines will provide Member States wishing to plan and implement NATIS in their country with the necessary framework to "establish not later than December 1978 appropriate coordinating national organs with clearly designated powers and responsibilities for the detailed study of all problems involved and the elaboration of plans for the effective implementation of NATIS within the national framework", as recommended by the Intergovernmental Conference.

An analysis of the effectiveness of these two guidelines in assisting Member States to establish national policies and prepare national plans for NATIS will help the Unesco Secretariat to revise or extend their contents.

This draft document should be considered as an extension of NATIS objective n° 1 (see COM.74/NATIS/3 Rev).

PREFACE

This document is concerned primarily not with "what to do" or "how to do it", but why something should be done about improving the flow of information. It assumes that the main case for this arises from :

a) an appreciation that information is an important resource ; and

b) an appreciation that the existing arrangements are inadequate.

The latter can best arise from a study of the flow or rather the non-flow of information, so that an initial requirement is a "research" wing which will collect objective data on this topic.

A study of this data should indicate which services should be developed or modified and what new services might be considered. Recommendations of these types could be guided by the experiences of services in other countries and they should only be made after considering the possibilities of international co-operation. However, once the recommendations have been finalized, it is necessary to have effective machinery to see that they are implemented.

1 WHY IS AN INFORMATION POLICY NECESSARY ?

Man is distinguished from the rest of creation by his ability to record his thoughts and observations and make these records available to others remote in time and place. These records (1) contain information which can be of value in tackling the scientific, technological, sociological and cultural questions which face mankind, but to be of value the potential user has first to discover which records he needs and then he has to be able to consult them. This process is becoming more difficult because of the growing volume of records. It is becoming more important because of the growing complexity of human society.

Faced with this problem many different organizations have endeavoured to provide facilities to help their particular clients to discover and to consult the records in which they have a special interest. The organizations which have done this include government departments, local authorities, professional societies, universities, industrial concerns and research institutes. However the total facilities available are usually inadequately co-ordinated. They may as a result provide unnecessary duplication in some spheres and inadequate facilities in others. Because of the importance of information Unesco urges Member States :

1. to review at the highest levels the existing arrangements, both national and international, for providing access to information ;
2. to draw up plans for improving the existing arrangements.

To achieve this goal a conceptual framework has been designed which, for brevety, is known as NATIS.

The information problem exists in all subject fields and involves all types of records, both published and unpublished. It is con-

(1) In this guideline a "library" is a collection of records whether published or unpublished. The records are usually, but not necessarily documents. Libraries usually maintain services to provide information but other organizations also maintain "information services". "Librarians" work in libraries and some of them are "information officers" but "information officers" may work in other types of organizations.

cerned with the creation and maintenance of literacy and the more sophisticated services required by scientific research. The facilities provided for supplying information differ from organization to organization and from subject field to subject field. Moreover the arrangements are changed from time to time. However the nature of the problems can be illustrated by the position in science.

When in 1661 the Royal Society of London was founded there were no scientific periodicals. Newton could, and probably did, read all the scientific literature which was published in his time. Since then the output of scientific literature in the world has been doubling every fifteen years or so. In other words the total volume of scientific literature has been increasing about a hundred-fold every century. With this enormous increase in output special guides have had to be devised to help scientists to discover the titles of the particular items they wanted to read. Even this is no simple task because the volume of the existing guides to scientific literature is now about the same as the total volume of scientific literature 100 years ago.

The dimensions of this problem can be grasped by considering one of these guides - "Chemical Abstracts". This is an index to the chemical articles published in some 12 000 current periodicals. The volume of this literature is such that there are probably not more than six libraries in the world which have at least 90 % of these periodicals, although any of

the articles indexed may be of special interest to a chemist anywhere. For nature obeys the same scientific laws everywhere.

Initially, the scientific literature and the guides to it were all printed publications but more recently the growing dimensions of the problem have led to the use of microforms and computer retrieval systems.

The essential features of this story are that the increase in the output of information has necessitated a continuous change in the methods used for dealing with the records. Now the position is such that only co-operation on a world basis will make it possible to provide adequate access to the available information.

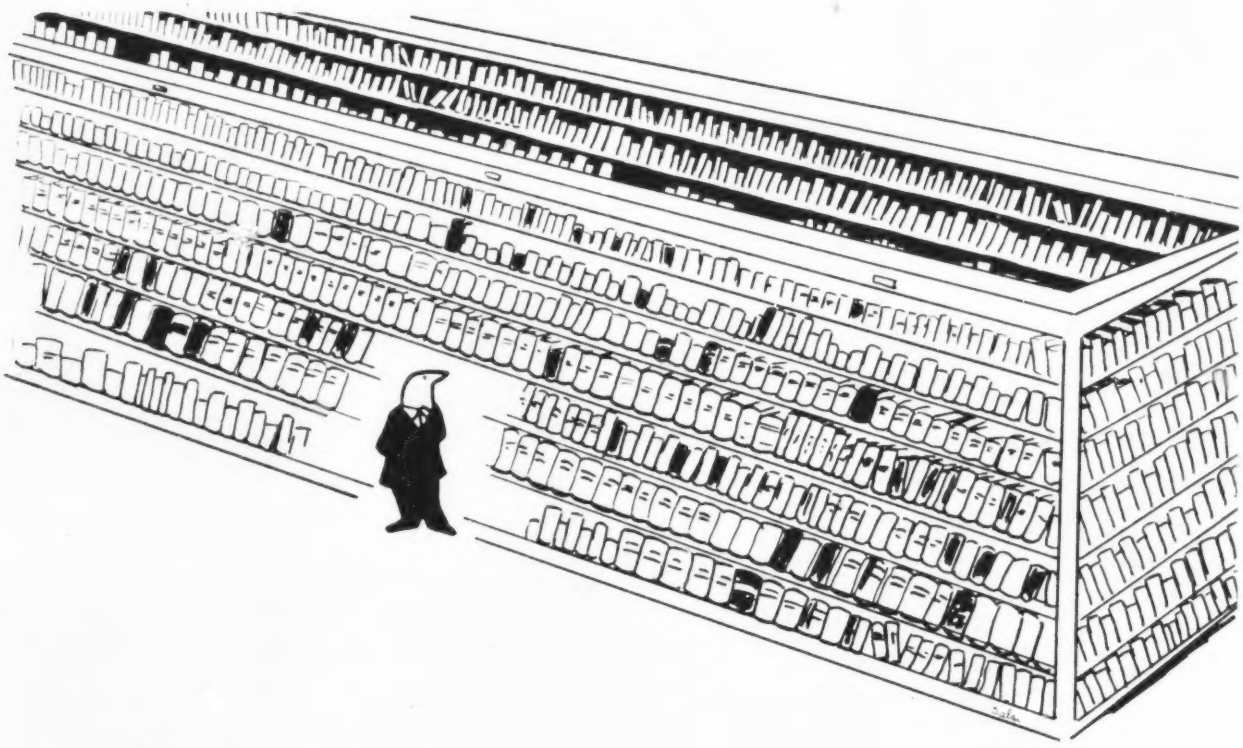
The importance of the literature of science to scientists was set down in the following declaration of the Royal Society Scientific Information Conference in 1948 :

> Science rests upon its published record, and ready access to public scientific and technical information is a fundamental need of scientists everywhere.

More recently Unesco, conscious of the importance of providing access to scientific information, has urged each Member State to establish a focus for dealing with this problem. A programme for this activity has been launched under the acronym UNISIST.

However, it is clear that the scientific information problem is only part of the total information problem, for scientific information should not be applied without considering both economic and sociological factors. Moreover there are no strict subject limitations on the functions of many of the organizations concerned with scientific information nor on the usefulness of the methods employed for disseminating information in the scientific field. It is for these reasons that it has been decided to urge all Member States to review the total information problem and consider what should be done to improve access to information by establishing some NATIS machinery.

This recommendation is made to all Member States irrespective of their state of development. In some countries the major problem will be to create facilities where few exist at present. In other countries there



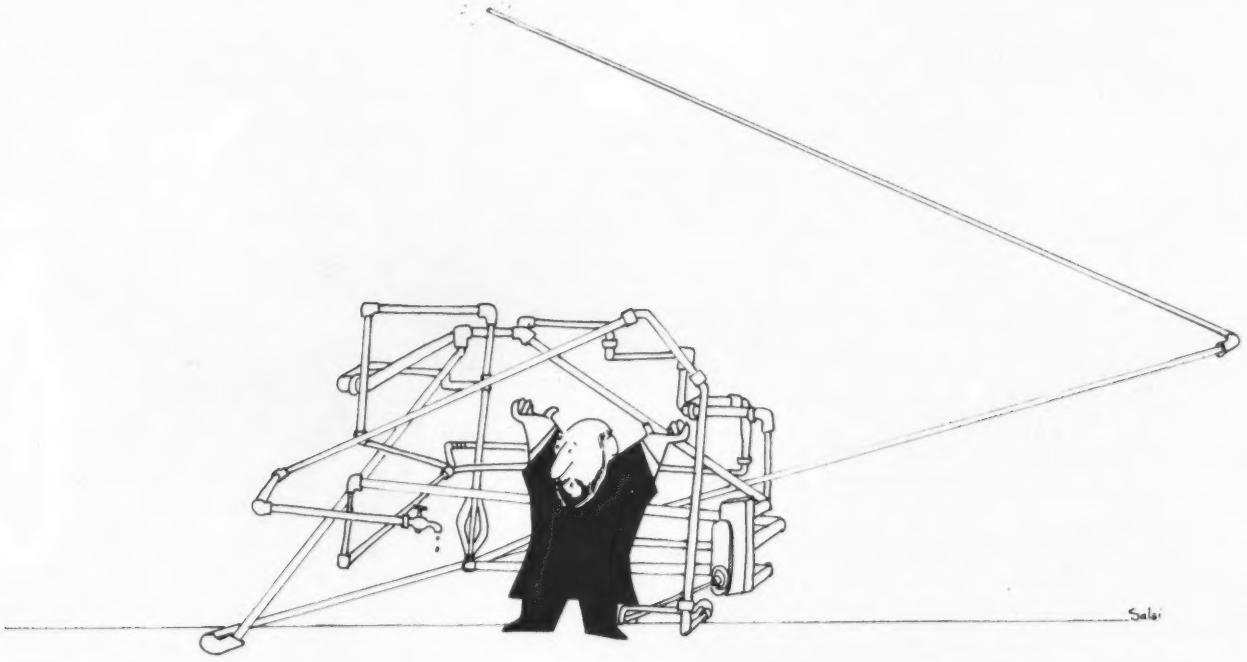
will be a special need to consider how to modify their existing arrangements. The continuous expansion in the volume of available information and the development of technological possibilities mean that facilities which may have been adequate a few years ago may not be adequate today.

In all countries it is necessary for social progress to make the fullest use of the available information. International co-operation to facilitate the supply of information is available but, to be successful, international co-operation depends upon adequate national arrangements.

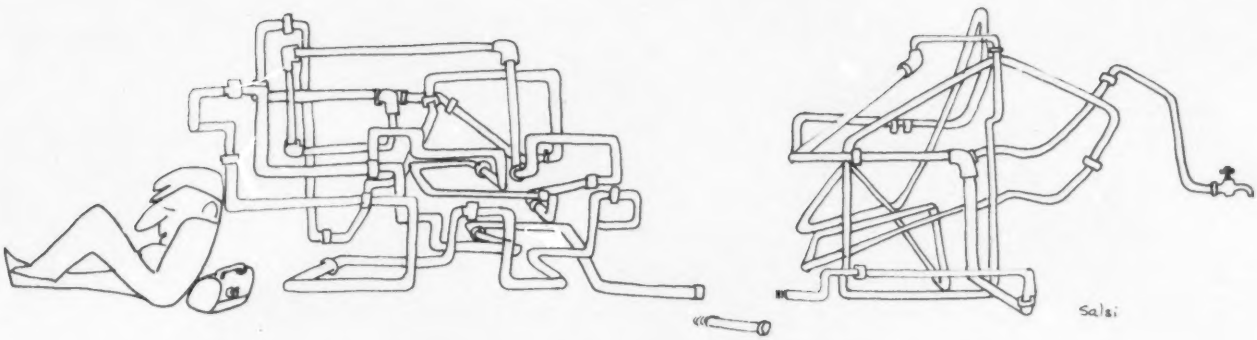
2 REVIEW OF CONSTRAINTS TO THE FLOW OF INFORMATION

The framework for an answer to the question "What should be done to improve the flow of information" can be deduced by considering a potential user of information. He has a problem. If he knows what sort of information he needs and where he can find it, all is well. But if this is not so what does he do ? He may of course do nothing because he has no faith in the existing arrangements, or because he is loathe to reveal his ignorance, or even because he does not even know he has a problem, or cannot read. Even if he approaches a library, an archive or information service the fear of revealing his ignorance may operate and he may leave without the information he needs and without seeking the assistance of the staff. Perhaps he has no confidence in the staff because of earlier experiences. Perhaps this lack of confidence is justified. Perhaps it is not.

The potential user may fail to use the organization he approaches properly because he does not know which are the appropriate guides or services for the sort of information he is seeking and the staff available may not be able to help him. The necessary guides may not be available in the organization visited and due to the shortage of adequately trained staff, those available may be unable to direct him to an organization which could help. This could be because such an organization does not exist or because the staff approached do not know of its existence. In some instances, suitable guides may never have been prepared.



Even where the potential user knows or discovers which documents may help him he may be unable to consult them because copies are not available locally and they cannot be obtained in time from any known and convenient source. Here again the failure to see the documents he needs may be due to the user not using the available facilities properly or because these facilities are inadequate.



The existing arrangements for making information available may thus fail in a variety of ways. Careful investigations are probably necessary to reveal which are the more important causes of failure.

3 THE NATURE OF INFORMATION

Before attempting to assess the existing information supply arrangements and whether they meet the present and potential needs of users, it is essential to consider the nature of information.

Some writers have described information as a commodity. This concept has led to attempts to consider the market value of information and the price the user is prepared to pay for it having regard to its value to him. This approach has inevitably led to so called "market research" about information services using such questions as 'what sort of information would people buy if it were available ?".

This line of thinking is based on the idea that the information services required could be determined by normal economic considerations. If this approach is sound it would provide a relatively simple way of determining what should be done about information.

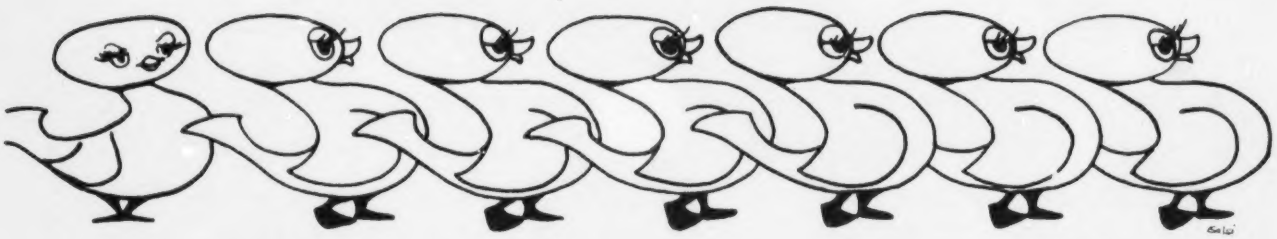
However, so far, this approach has not produced any useful results. Unfortunately, those who have regarded information as a commodity have not gone on to consider that if this were so it is a very strange sort of commodity. For instance, information can be transferred from A to B without the supplier, A, being any the poorer. Indeed, if the recipient, B, has no use for the information he may not be any the richer. It is only

possible to discover after you have acquired some information whether it is of any use to you.

Some more specific examples could be given. For instance, in many countries one of the objectives of school and public libraries is to promote the reading habit - to help people to learn to read and to retain the ability to read. The information supplied by this reading is of secondary importance. It is clearly impossible to value the information supplied in any financial terms. The same problem arises with the more sophisticated sort of information - the type of information used by scientists. Such information may vary from a hard fact such as the density of a particular liquid, to the latest ideas about the structure of the atom. The information needed may be required to facilitate some practical development or to examine some theory. Its purpose may be only that of a mental catalyst which initiates a new line of thought. In economic terms such information has no immediate and obvious value. Eventually somebody may use some ideas derived from such information to improve mankind's control over nature and to increase wealth.

A consideration of the theoretical and experimental steps which led to atomic power demonstrates that it is not possible to divide up the increase of wealth between information and research. It is thus impossible to place a financial value on each of the different information services which were used. However the total value of the information supplied is greater than its cost for, without information, there would have been no development.

Scientific activity may be likened to a gaggle of geese some of which sometimes lay golden eggs. It is impossible to say which goose will lay golden eggs or when. You cannot judge by a goose's previous habits or its ancestors. All you know is that if you have a number of geese of the right kind, and if you give them adequate accommodation and food and a plentiful supply of information, some will lay golden eggs.



But such is the nature of the process that it may not be immediately obvious which eggs are golden eggs. Eventually the total value of the eggs will be far greater than the total cost of providing for the geese. Indeed, if we look around the major cause of the increasing wealth we see is the result of scientific research and development and the use of the information obtained. It is impossible to divide the wealth created by this activity between research and information.

Whilst specific examples might be quoted of items of information which resulted in particular savings such instances are rare. The essential fact is that information is not a commodity which can be measured in units to which can be assigned particular values. It is thus not possible tu use narrow economic considerations to decide details of the information programme. The information man is quite different from the economic man.

4 THE NATIS PLANNING MACHINERY

The question of deciding what sort of machinery is necessary to give effect to the NATIS concept is not an easy one. All government departments need an adequate information system and some, such as those concerned with economic planning, trade and industry, agriculture, social welfare and education have a special interest in the supply of information.

But to leave each department interested to decide its own information policy, as is often the case at present, produces an uncoordinated bunch or arrangements. Moreover, the information supply arrangements are not only of importance for government activities, they also

affect the activities of the professions, industrial concerns, universities and research institutes. The danger thus is that because information is of interest to everybody it is the responsibility of none.

In an attempt to eliminate this danger in one country information planning was made the responsibility of the executive office of the president. However, this was ineffective because the machinery was not used. It is thus essential to have not only adequate machinery but the will to use it and to make available the resources to back it up.

The difficulties of achieving this state of affairs have three main causes. First, the continuous growth in the volume, complexity and importance of information means that the rate of increase of expenditure on this topic should be greater than the rate which applies to most other items. Secondly, the nature of information is such that the cost of providing it cannot as a rule be recovered from the users (see Chapter 3).

The third main difficulty is the fact that the failures of the information supply arrangements, unlike those concerned with, say, electricity supply, transport, housing supply or drainage, are not obvious. They may nevertheless be as important. It is thus necessary to collect and make known evidence about the efficiency of the information system.

It is relatively easy to discover the number and extent of electricity supply failures or the number of people killed upon the roads. But how do you know when there have been failures of the information supply system ? Because of the difficulties few attempts to do this have been made. As a result, some rely not on objective data but on inborn prejudices or what they were taught and others hold that to attempt to discover the defects of the information supply system is like trying to measure the number of undiscovered murders. To steer a middle course between these extremes it is necessary to have a research and development capacity which will :

a) make objective surveys of the existing information supply arrangements within a country ;
b) be able to compare and contrast the results of these surveys with surveys made elsewhere where different systems are used ;
c) be able, if necessary, to establish experimental services to see what use is made of them.

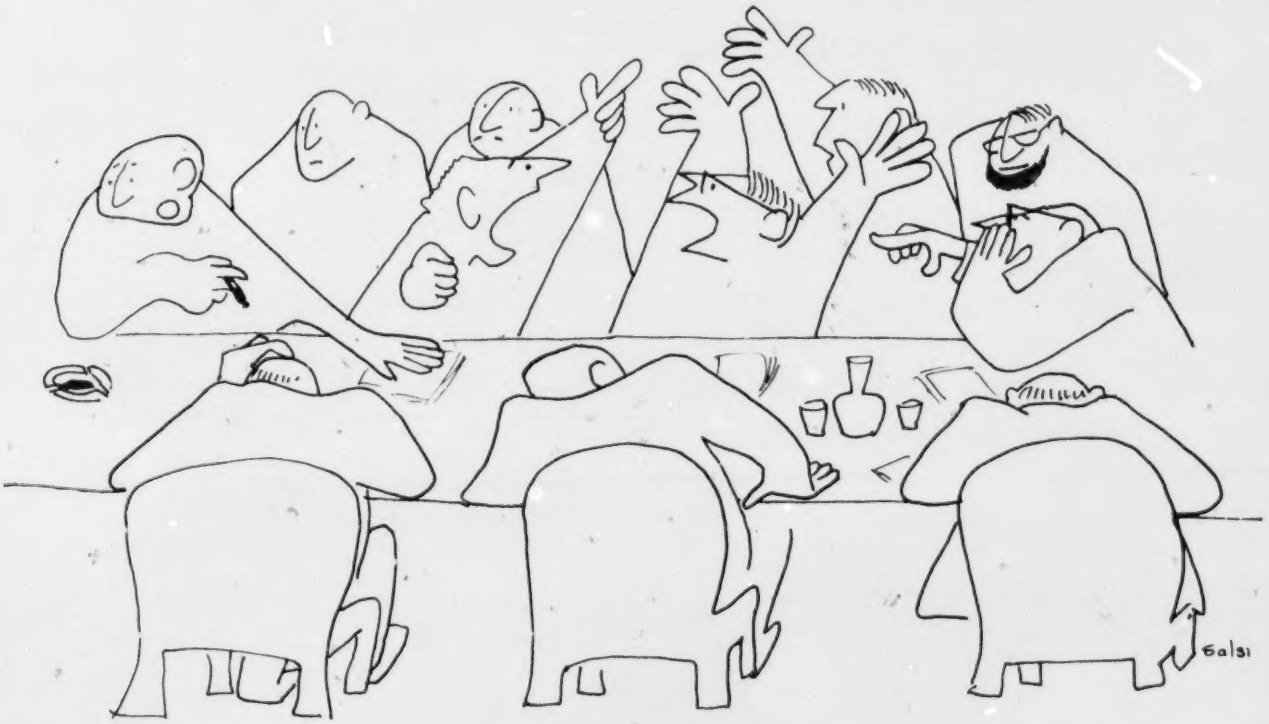
This activity would need adequate resources and have the authority to carry out investigations in all types of organizations. There is a special need to attract people with analytical minds and the highest intellectual calibre to this work.

Whilst it is relatively easy to describe the research wing of the NATIS planning machinery it is more difficult to be specific about the main part of the machinery. This would be concerned with making plans for improving the information supply arrangements as a result of the data provided by the research wing. Undoubtedly, the type of machinery adopted will vary from country to country and will depend a great deal upon a country's economic development and political structure. However, the ability to carry out the following tasks is essential :

a) wide dissemination of the results of the research wing particularly to politicians, administrators, users and future users of information and to library schools ;
b) wide dissemination of the information development plan drawn up as result of the consideration of the existing arrangements, the national priorities, possible developments and the costs of different proposals ;
c) the provision of some financial support for the more important elements of the information development plan.

Whatever type of planning machinery is adopted it should be user-orientated and cost-conscious and it should be realized that it has a major public relations responsibility.

In many countries this type of planning activity would be the responsibility of a co-ordinating body. To be effective such a body should not be too large, say a maximum of 16. Such a limitation presents a problem because as a rule the number of organizations in a country which are concerned with information is much larger than this. In consequence, it may be desirable to create a much larger representative assembly to act as an advisory council, made up of representatives of interested organizations. This council could receive and discuss reports from the co-ordinating body and suggest ideas which might be considered. The council could play an important part in the public relations activity.



The co-ordinating body would have a semi-judicial function - it would be concerned with collecting and assessing the evidence. To ensure that its recommendations are respected it clearly should not have a majority of members who are actively concerned with organizations which have, or which might have, major information activities. In particular, those who are actively concerned with libraries and information services should normally not be members of the committed but be used as professional advisers. It is most important that the co-ordinating body should have

a secretariat of high calibre and be able to commission special surveys where these cannot be carried out by the research wing.

Ideally the co-ordinating body should be executive but in view of the wide ramifications of the information system it will usually be impossible to make it executive with regard to all information activities. However to the extent that it is advisory, the co-ordinating body should not be subservient to any minister or government department either as regards the subjects it considers or the dissemination of the results of its deliberations.

5 ASSESSING THE NATIONAL SITUATION

Chapter IV has outlined the major difficulty in assessing the existing information supply arrangements - the failure of the system to provide information when it is wanted is not at all obvious. This situation often produces the idea that the solution lies in providing copious descriptions of the existing physical and human resources. By itself this approach is likely to produce so much data that it would be difficult to see the wood for the trees. As a result it would be difficult by looking at all the data to know what actions to consider.

To avoid this situation a more analytical approach is necessary. An outline of the basic questions is implicit in the description of the possible failures of an information system to meet users needs which is given in Chapter II. Here perhaps it is important to stress that the problem is to discover what the user needs - not what he thinks he wants. His wants are conditioned by his experience and how he thinks he operates. However, it is extremely difficult for even highly intellectual people to be really objective about their activities. This difficulty makes it impossible to estimate with any accuracy how a proposed new service would be used. However, some guidance about the likely demand on a proposed new service may be obtained by considering how a similar service elsewhere is used. If such a service does not exist it may be necessary to consider establishing a service upon an experimental basis and see what the demand is.

The evaluation of any information service is a complex task. The cost in financial terms both to the suppliers and the users can be ascertained although sometimes this presents some technical difficulties. A comparison of the costs of similar services can give some idea of their internal efficiencies.

The nature of information (see Chapter 3) is such that the benefits resulting from a particular service cannot normally be measured in financial terms. In addition no common units are usually available to compare the outputs of two different services. Indeed, rarely are two services concerned solely with producing the same sort of outputs.

Consequently attempts have been made to use concepts derived from economics to assess services by asking such questions as what a user would pay for some existing service. However, for the reasons outlined in considering the nature of information such attempts to produce useful results should follow a methodology.

The inherent difficulties of assessing information services force us back to basic principles. The primary objective is to pass information from a source to a user. If we are to improve this flow we need to know where it is breaking down. The breakdown in the flow of information is of two types :

1. The potential user of some type information does not even try to obtain it.

2. The user tries, however inexpertly, to obtain some information but does not obtain it.

The first category may arise from a variety of causes including :

a) lack of education which makes the potential user unable to formulate his problem ;
b) lack of appreciation of the possible value of information ;
c) lack of knowledge or appreciation of the potential possibilities of existing information services ;

d) the absence of suitable information services.

An examination of the use of information services elsewhere may throw some light on what might be done to improve the use of information by existing non-users. However, no really satisfactory technique has yet been evolved to determine objectively by direct investigations what should be done about "non-users".

Nevertheless it is probable that the potential user who does not try to obtain some type of information is not a complete non-user of all types of information. Thus, if a user is satisfied when he seeks some elementary information, he is more likely to use the information services to obtain other types of information. Hence an improvement in the effectiveness of the supply arrangements when users approach information services could have a major effect in increasing the utilisation of information.

Thus investigations of the failures of the existing arrangements to meet actual users needs will indicate not only what might be done to improve the services for existing users but also how to widen the circle of users.

In consequence, the main problem in assessing the existing information flow arrangements is to discover the relative importance of the different types of flow failures. The possible types of flow failure include the following :

a) failure of the user to appreciate the nature of his problem ;
b) lack of users and/or information service's staff know-how ;
c) non-availability of the appropriate guides ;
d) failure of the users to approach the service staff ;
e) non-availability of suitable staff to assist the user ;
f) non-availability of the required documents within the user's time limits ;
g) lack of knowledge of the resources of other services ;
h) limitations of access to some appropriate services ;
i) non-existence anywhere of suitable guides to some documents ;
j) non-existence of the appropriate services.

The main features of the process which leads to the use of information are the same everywhere - the user appreciates that he has a need for information : he consults a suitable source and then he has to obtain the information. In consequence, the information services in other countries may indicate what additional services should be created within a country. This approach is likely to be particularly useful if it is possible to compare and contrast the information flow and non-flow using the methods outlined above.

However, the importance of information services in other countries is not limited to providing comparative data. In some instances the services provided within a country may be of value to users outside the country. As far as the user is concerned if the guide to information or the information itself is in a language the user can understand it does not matter where it was produced. Economic considerations might in theory justify the production of a guide to the literature to replace a foreign guide, but in practive the cost of producing guides is so high that such action would rarely be justified. Some guides are so expensive to prepare that they are only produced with the support of organizations in several countries. Other guides to information, whilst they may have been designed for the members of a particular society, are so comprehensive that they in fact provide a world service. This applies particularly to the guides to the recent literature in some subject fields. If they are in languages which can be understood by most of the potential users in a country there is little point in duplicating them. If they present linguistic difficulties the question to be decided is whether to train potential users to understand the languages concerned, or whether to embark upon a programme of producing subject guides in a national language.

6 DEVELOPING THE INFORMATION PLAN

An adequate system to provide access to information would include the following features :

1. The potential user would be regarded as part of the system. His education would assist him to diagnose his problem and be such that he would not fear to reveal his ignorance when seeking assistance.

2. The educational system would recognize as Johnson said "Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it".

3. The staff of the libraries and information services would be trained to know what guides to information exist and how to use them. They would also know where these guides were available. Their subject expertise collectively would be able to help the potential user to diagnose his problem or to refer him to experts elsewhere.

4. Arrangements would exist to facilitate access to the documents the user required which were not held in the organization originally consulted.

5. It would recognize that if information is to be made adequately available neither a single service nor the information system of any country can be a self-sufficient island.

6. There would be some machinery for co-ordinating and improving the total system for providing access to information. This machinery would be concerned with investigating the existing arrangements and with plans for improving them. In considering proposals the planning machinery would have regard to national priorities and the costs of implementing particular plans and the benefits likely to result from them.

7. The planning machinery would recognize that the problem of providing access to information keeps changing as the volume of information and the number of users continue to increase and as the application of new technologies to the supply of information becomes possible and economically feasible. It would also recognize that those concerned with existing organizations have a strong inclination to preserve the status quo.

The review of the existing arrangements for supplying information will inevitably result in a wide range of proposals for improving the "system". These proposals might be divided under the following headings :

a) improving the education of potential users ;
b) the training of librarians and information specialists ;
c) improving access to existing services ;
d) improving and expanding existing services ;
e) creating new services.

Some of these measures could be achieved by the re-orientation of existing programmes but many would involve additional resources. Because of the difficulty the user faces in valuing information it will only be possible to obtain some of the additional resources necessary by making direct charges on the user. However, the total resources required by the information services will only be a small percentage of the total national expenditure. In consequence, the planning should go ahead on the basis of what resources could be usefully employed, rather than what resources it is thought might be made available.

There are built-in limitations on the resources which can be usefully employed. Library collections cannot be suddenly created. They must be built up over years. Library collections cannot be fully exploited unless they are suitably housed and adequately staffed. Buildings and trained staff cannot be suddenly produced. The conversion of non-users into actual users cannot take place overnight. However, it does not take a generation to make a major change in the situation. A great deal could be accomplished in five to ten years.

In considering the resources necessary for a particular programme it has to be remembered that these will increase as the demand upon the services increases. The demand upon a service will depend upon a number of factors but an important one is the confidence of users in the service. For many services the supply creates the demand.

Because of the nature of information it is not possible to compare the "value" of information services with the cost of the resources necessary to provide them. It is, however, often possible to reduce the resources which would otherwise be necessary by improving the internal efficiency of individual services and of groups of services taken together.

This should be a continuous process. The increase in magnitude of the operations of a service may make it possible to adopt more economic procedures. The development of some services may make other services less necessary.

In preparing the initial plan it is essential to have regard to the national priorities - the need to improve and maintain literacy - the need to develop agriculture or industrial activities - the need to improve public health - and so on.

Besides the national priorities there will be priorities inherent in the plan itself. For instance, potential users of information cannot be educated to use information until the educators know how to use it. In consequence the information plan must be carefully phased.

1. Improving the education of potential users

The educational requirements of the potential user are :

a) literacy ;
b) subject knowledge and understanding ;
c) that curiosity of the mind which makes him want information ;
d) the ability to use information services and the confidence that they can provide useful information.

These requirements are not separate goals. Literacy is not merely a question of being able to read but of being able to understand the vocabulary in particular subject fields. Thus it is linked with subject knowledge and understanding. This is not merely a question of learning what is known but of creating a curiosity of mind and an appreciation that the volume of knowledge keeps expanding. It is thus necessary to teach the student how to use libraries and information services. Unless the technological student knows how to do this he is out of date as soon as he collects his diploma. An ex-student may be able to keep himself up-to-date if he knows how to use information services. It is thus desirable as part of his further education to keep him up-to-date about the development of information services.

The further education on the recent developments in the information field would require additional resources. However, the other developments in the educational field could often be achieved with little or no extra resources by re-orientation of the existing educational programme. This might involve the education of the educators.

2. Training of librarians and information specialists

The staffs of library and information services need a wide range of individuals with different skills and potentials. The individuals needed include those who have managerial skills, those who have the abilities to introduce new technologies, those capable of original thought about information problems and the technicians who may only be capable of operating the procedures which have been adopted. The different end products require different training arrangements and they should be applied to individuals of adequate calibre. So the question of training must be linked with the selection of those of adequate calibre for the required end product.

The continuous expansion in the volume of information and demand for it means that the information service requirements keep changing. This creates a need for a cadre of individuals who have analytical minds and who are capable of original thought. Because of this, and the need to apply new technologies in information services, it is desirable that this cadre should include some who have been trained in science and technology. Those who have had a sound training in a subject field are more able as a rule to make information available in that subject field. It is thus desirable to attract to this work some who have had experience in scientific research and development work. However, because of the complexity of some of the information problems those should not be people who have ceased to be creative. The training arrangements for such people have to allow for the fact that they will have already started their careers. To secure the best people it is essential to ensure that they would have comparable career prospects to those they would have enjoyed in their original careers.

For those who will operate and eventually manage information services it is desirable to have people with numerate and analytical minds to apply fully the innovative library and information services.

Whilst the training of such people should include something about the history of information and about information procedures it should be primarily concerned with developing the art of thinking about the problems of improving the supply of information to the user.

3. Improving access to existing services

Many organizations have created information services in an ad hoc way to meet some of the needs of their particular clients. For instance, some university libraries provide services only to members of their universities. They could provide services to others. Some libraries have been created solely to provide reference services. Often they could provide lending services to a much larger number of users without interfering appreciably with the services to their readers.

These possibilities exist because most of the resources of a library are not fully used at all times. The seats in a reading room are seldom all occupied, only a small percentage of the stock of a library is in use at any one time and the subject experts on a library staff are often not fully occupied with their expertise. Increases in the accessibility of existing services may involve some increase of resources, but the increase of the total resources necessary would not be proportional to the increase in use.

A major difficulty in improving access often arises because the organization responsible for a service is financed by or for its members only. The question of how such organizations should be financed to provide a service to others is one to which the NATIS Committee should give special attention.

4. Improving and expanding existing services

The need to improve or expand existing services arises from :

a) evidence of actual failure of the service to meet users' needs ;
b) estimated new requirements, particularly an increase in demand.

In planning to meet these needs it is necessary to appreciate that a precise estimate of requirements will not normally be possible. In practice

it is essential to take a pragmatic approach to the problem - provide additional resources and see what happens. This is particularly necessary in view of the difficulties of estimating the future demand.

In preparing plans to improve or expand an existing service it is necessary to consider the different elements of the service separately. It is likely that these elements are not at present in balance and in any case will need expanding to different extents to increase the capacity of the service.

In preparing a national plan it is necessary to consider the existing services in relation to each other. This raises the problem of considering to what extent the existing services should be supported by central services. For many services the unit cost per demand should fall as the demand increases, but centralising to benefit from this may result in the service to the user deteriorating due to an increase in the supply time. It may be possible to avoid this by the adoption of new procedures.

5. Creating new services

The possible new services within a country can be divided into two groups :

a) services which are similar to those elsewhere ;
b) entirely new sorts of services.

The first group would include the following where they do not already exist :

i) services designed to make available to potential users existing guides to information ;
ii) services to provide the information or documents required by users as a result of using the guides.

The practice in other countries can be of some assistance in deciding what to do about the provision of such new services provided some allowance is made for the differences in the numbers and distribution of likely users. However, before creating new services, careful consideration should be given to improving the accessibility or the use of existing services both in the country and, particularly for rarely used documents, elsewhere.

As far as library services are concerned it is important to remember that no country is an island. For heavily used publications it will usually be best from the points of view of supply time and cost to have a service based upon a collection within a country. For rarely used publications, and the majority of publications in the world fall into this category, it may often be economic to rely upon a foreign service. This particularly applies when the requirement is likely to be for photocopies of articles in periodicals. The volume of "heavily used" publications will of course increase as the use of information increases.

The possibilities of using information services provided in other countries creates two responsibilities to the international community which should be accepted within each country. The first is to ensure that there exists an adequate bibliography of the current publications of that country - this is an essential requirement to achieve the aim adopted by Unesco of Universal Bibliographic Control (UBC). The second responsibility is to ensure that adequate arrangements exist for providing, when requested, loans or photocopies of the country's publications through some central organization to similar organizations in other countries.

Whilst in general it will be found that the international flow of documents as loans or photocopies only accounts for a small percentage of the flow within a country it appears essential to consider whether it is being hindered by the currency, customs or postal regulations.

The creation of entirely new sorts of services should be approached with caution. The question should first be asked why have these services not been considered essential elsewhere. Where guides exist, it would be more expedient to make use of them rather than to produce new ones. There are undoubtedly some subject fields for which no existing guides to the literature are satisfactory. If such fields are considered to be of importance in a particular country then the possibility that the guides should be produced by international collaboration should first be considered.

In considering the information plan it cannot be stressed too often that no country is an island. Information produced anywhere may be of value to users everywhere.

7 FINALIZING AND PRESENTING THE NATIS PLAN

Information, like the oxygen in the air, is a universal resource. However, whilst everyone is born with apparatus to use oxygen we are not born with the ability to use information. Moreover, whilst it is obvious when men suffer for lack of oxygen it is generally not at all obvious when there is a failure due to the non-use of information. So the first requirement of any NATIS plan is to present the concept that information is an important resource and that, like the oil under the earth, we have to provide apparatus to extract it and learn how to use it.

To put these ideas over we need specific information about the failures of the existing information supply arrangements. These are necessary both to indicate where they are inadequate and to give some idea of the relative importance of the different measures proposed.

To achieve its objectives the NATIS plan would require a growing appreciation of the importance of information, particularly amongst those responsible for the educational programme, the administration of existing services and the allocation of national resources. As already stated an initial objective should be to educate the educators so that they aim to make students information conscious and to provide them with the know-how to use information services.

However, education in the use of information services is only likely to produce real results if the users have confidence that the existing services can help them to obtain the information they need. Since the information supply situation cannot suddenly be transformed, it is important that confidence in its future possibilities is not damaged

by making claims too early or too large for what can actually be achieved. As, in the development of confidence, nothing succeeds like success, it is important that the developments as presented to the user have clearly defined stages which he can appreciate. If necessary, the phasing of the provisional plans should be amended to achieve this.

To achieve its objectives it is necessary for the NATIS plan to provide the following facilities :

a) guides to information ;
b) sufficient staff to help users obtain the information they need ;
c) arrangements to provide rapid access to the documents or copies of the documents required.

The ability of the library system to provide quickly a copy of a needed document which is not available locally can help to create the idea in the user's mind that there is an information system which exists to help him. So serious attention is necessary to considering how this can best be acheived.

Undoubtedly, the information services will require additional resources to carry out parts of the plan. Some of these resources could be made available by re-orientating the existing programmes and improving the procedures used. For instance some libraries acquire some publications only because they exist. In fact the demand for many of these publications is very low and might be satisfied by inter-library lending if an adequate system existed. Any resources saved by this approach could be used to expand other parts of the library's activities.

To achieve a re-orientation of activities it will be necessary to eliminate the idea which some staffs have that a single service can provide a comprehensive service by itself- that the purpose of some libraries, for instance, is to create collections as complete as possible and to make detailed records or what they contain. In place of this philosophy it is necessary to establish the idea that each library and information service

is but part of a total system whose objective is to provide the potential user with the information he needs.

There will always be limited resources for information work so the question of the optimum use of resources must be considered. In doing this it is necessary to remember that there is a law of diminishing returns. This makes it uneconomic to strive for a 100 % perfection in any service as this would bring it into the zone of rapidly diminishing returns.

Part of the problem is to expand and improve library education. So it is important to ensure that schools of librarianship and information science are turning out students with the right philosophy for the future. This may mean that it is important to educate the staffs of such schools. It is also important to ensure that arrangements exist for the re-training of the existing staffs of libraries and information services.

Whilst it is possible to describe the qualities of the staffs required by information services, it is difficult to estimate with any accuracy the quantity of staff which will be required for an expanding programme. This is because the growth of demand depends not only on the growth in the number of likely users but also on the growth of their confidence in the ability of the information services to help them. This means that the plan has to have some degree of elasticity to cater for different rates of growth of demand.

Estimating the resources necessary to deal with an unknown future demand can be facilitated to some extent by pricing some services to cover their "run-on" costs. For instance the prices of photocopies may be made such that they cover the direct costs of labour, materials and postage of providing the photocopies.

Another factor which can simplify estimating for an unknown demand is a continuous review of methods. If the appropriate methods for the magnitude of the demand are used the unit cost should decrease as the demand increases.

Finally in presenting an information development plan which requires additional resources it should be stressed that whilst information can make a large contribution to social progress, its total cost is a mere bagatelle in the total national expenditure. Information is a valuable universal resource but thought and expenditure are necessary to benefit from it.